GNHWPCA
Protecting the Environment

Greater New Haven Water Pollution Control Authority
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May 16, 2014

Via Certified Mail

United States Environmental Protection Agency
New England Region
5 Post Office Square, Suite 100 (OES 04-01)
Boston, MA 02109-3912
Attn: Jack Melcher

Connecticut Department of Energy and Environmental Protection
Bureau of Water Protection and Land Use
Planning and Standards Division
79 Elm Street
Hartford, CT 06106-5127
Attn: George Hicks

RE: Response of the Greater New Haven Water Pollution Control Authority to the USEPA Request for Information dated February 13, 2014 – Questions 1 through 14

Dear Mr. Melcher and Mr. Hicks:

Enclosed please find the narrative response, certification, tables, figures and a list of referenced documents submitted in response to Questions 1 through 14 of the February 13, 2014 information request issued by the United States Environmental Protection Agency (USEPA) to the Greater New Haven Water Pollution Control Authority (GNHWPCA) pursuant to the Clean Water Act Section 308(a); 33 U.S.C. § 1318(a).

We believe the enclosed documents provide a full and complete response to all of the items requested pursuant to Questions 1 through 14.

As always, we are available to discuss any of these items as you conduct your review.

Sincerely,

The Greater New Haven Water Pollution Authority

Mr. Sidney J. Holbrook
Executive Director

Response of the Greater New Haven Water Pollution Control Authority to the
USEPA Request for Information dated February 13, 2014
Questions 1 through 14
May 16, 2014

OVERVIEW

The Under Air Rights Garage (UARG) is served by a dedicated storm drain system that was constructed by the Connecticut Department of Transportation (DOT) in 1957 and 1979. There are no sewer connections or sewer flows to this storm drain system. This drain is known as the "Route 34 Drain" in the Cardinal Engineering SWMM model. The Temple Street Garage (TSG) is also served by this same dedicated drain system. Again, there are no sewer connections or sewer flows to this drain.
A schematic of the drain system in this area is included in the Overview Attachment.

There are four combined sewer overflow (CSO) regulators in the Union Pump Station service area. Each regulator is tributary to CSO 025 and is described below.

CSO Regulator 034 is located at the corner of George and Temple Streets. All of the sewers tributary to this regulator have been separated. The CSO is connected to the storm drain in Temple Street. This drain is known as the "Temple Street Drain" in the Cardinal Engineering SWMM model. The Temple Street Drain is independent of the Route 34 Drain and does not connect to the Route 34 Drain until it reaches the Union Avenue Junction Chamber (over one half of a mile downstream of the UARG and the TSG). Flow metering data from our CSO Flow Monitoring Program at Regulator 034 confirms that the storm drain system overflows into the sewer system during rain events.

CSO Regulator 031 is located on South Frontage Road 380 feet east of the intersection with York Street. All of the sewers tributary to this regulator have been separated. Regulator 031 was closed on October 10, 2013. The CSO was connected to the storm drain in South Frontage Road. This drain is known as the "West Water Street Drain" in the Cardinal Engineering SWMM model. The South Frontage Road Drain is independent of the Route 34 Drain and does not connect to the Route 34 Drain until it reaches the Union Avenue Junction Chamber (over one half mile downstream of the UARG and the TSG).

CSO Regulator 032 is located at the corner of Portsea and Liberty Streets. All of the sewers tributary to this regulator have been separated. The CSO is connected to the storm drain in Portsea Street. This drain is known at the "Columbus Avenue Drain" in the Cardinal Engineering SWMM model. The Columbus Avenue Drain is independent of the Route 34 Drain and does not connect to the Route 34 Drain. CSO Regulator 032 is scheduled to be closed in 2014.

CSO Regulator 025 is located at the corner of State and Water Streets. Approximately 85 percent of the sewers tributary to this regulator have been separated. The CSO is connected to the Temple Street Drain. The Temple Street Drain is independent of the Route 34 Drain and does not connect to the Route 34 Drain until it reaches the Union Avenue Junction Chamber (over one half mile downstream of the UARG and the TSG). Flow metering data from our CSO Flow Monitoring Program at Regulator 025 confirms that the storm drain system overflows into the sewer system during rain events.

QUESTION 1. Provide a map of the combined sewer system tributary to the Union Street Pump Station. Include all regulators and cross-connections, both active and closed, with identifiers sufficient to identify each of the combined sewer overflow relief points listed in the Collection System Map,

provided at EPA's December 16-18, 2013 inspection; the Annual Progress Report, dated June 28, 2013; and the CSO Flow Monitoring Plan Status Report, dated December 18, 2013.

A plan of the sewer system tributary to the Union Street Pump Station is included in Attachment 1. Regulators 031, 032, 034 and 025 (which all discharge to New Haven Harbor via CSO 025), CSO 025, and the Union Street Pump Station are shown on the plan. Regulator 031 was closed on October 10, 2013.

QUESTION 2. Describe the current operating condition of the Union Street Pump Station. Include pumping capacity, the number of operational pumps, source of emergency power, and the most recent assessment of the pump station condition.

GNHWPCA personnel inspect the Union Street Pump Station on a weekly basis. The station is equipped with a SCADA system that alerts personnel in the Control Room at the East Shore Water Pollution Abatement Facility (ESWPAF) of any operational problems.

The most recent assessment of the Union Street Pump Station by an outside consultant was completed by Arcadis in December 2011. In general, Arcadis observed the Union Street Pump Station to be satisfactorily maintained and in fair operating condition. There are four vertical centrifugal pumps at the station, however, Pump No. 1 is no longer used due to inadequate pumping capacity. The pumping capacity of the Union Street Pump Station is 10,417 gallons per minute (15.0 MGD). There is no emergency generator on site. However, the GNHWPCA has two 150 kW portable generators and septic pumping trucks to service the pump stations that don't have on-site generators.

Arcadis acknowledged that the Union Street Pump Station was past its useful life. The current Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP), approved by the Connecticut Department of Energy and Environmental Protection (DEEP) in 2011, includes plans to replace the Union Street Pump Station. The proposed upgrades will include:

- Coarse screening
- Dry weather pumping to the East Street Pump Station via the existing force main
- Wet weather pumping to the ESWPAF via a new force main
- An on-site emergency generator, and
- Odor control

The construction cost estimate to replace the Union Street Pump Station is approximately $25 million (in 2009 dollars).

A copy of the applicable pages of the Performance Evaluation Report and the LTCP are included in Attachment 2.

QUESTION 3. Provide a list of dates since January 1, 2010 on which discharges from the combined sewer system or the sanitary sewer system have resulted in the release of sewage to the ground

surface in the area tributary to the Union Pump Station. Include information regarding the depth and duration of the storm event(s) preceding the discharge and the tidal conditions at the time of the discharge.

Based on a review of sewer customer complaints and Bypass Report Forms filed with Connecticut DEEP, there have been two incidences of discharge from the sewer system resulting in the release of sewage onto the ground surface (manhole flooding) in the area tributary to the Union Pump Station since January 1, 2010. Both events occurred along Union Street, over one half of a mile downstream of the UARG and the TSG, during heavy rain events. The first event occurred on October 1, 2010 and the second event occurred on June 23, 2011.

A copy of the Bypass Report filed with Connecticut DEEP, tidal data and rainfall data for each event are included in Attachment 3.

QUESTION 4. Describe the hydraulics of the combined sewer system tributary to the Union Pump Station for all sewers greater than or equal to 30 inches in diameter, and for any other sewer lines tributary to the Union Street Pump Station containing active CSO regulators. Provide the peak hydraulic grade line at mean high tide, for the 1-year, 2-year, 10-year, and 100-year storms of the following durations: 15 minutes, 60 minutes, 3 hours and 24 hours. This analysis should account for daily peak flows due to diurnal variations and seasonal peak flows during periods of increased infiltration. Include for reference the ground elevations, sewer manhole rim elevations, pipe invert elevations, pipe cross-section dimensions, pipe materials, and pipe slope.

A plan of the sewer system tributary to the Union Street Pump Station is included in Attachment 1.

All sewers with a nominal diameter greater than 30 inches are included on the schematic entitled "GNHWPCA Large Sewer Interceptors". All sewers within the 595 acre tributary area flow to REG 025, just upstream of the Union Pump Station. Approximately 85 percent of the combined sewers within the tributary area have been separated. Based on our flow metering data, average daily dry weather flows to the Union Pump Station are approximately 3 MGD. The pumping capacity of the Union Street Pump Station is approximately 15 MGD. Sewer flows during wet weather events can exceed the pumping capacity of the pump station. However, peak levels in the sewer at Regulators 025 and 034 do not exceed the manhole rim elevation. The overflow elevation at Regulator 034 is 12.70 feet and the rim elevation is 21.50 feet (8.8 feet above the overflow). The overflow elevation at Regulator 025 is 6.40 feet and the rim elevation is 18.0 feet (11.6 feet above the overflow).

Flow metering data from our CSO Flow Monitoring Program confirms that at Regulators 034 and 025 the storm drain system overflows into the sewer system during rain events (rather than CSOs occurring). The peak hydraulic grade line (HGL) in the storm drain system is considerably higher than the peak HGL in the sewer during rain events. Please refer to the City of New Haven's response to QUESTIONS 3 and 6 of the City's RFI for a discussion of peak HGLs in the storm drain system under the specified conditions.

Ground elevations (equal to sewer manhole rim elevations), sewer pipe invert elevations, sewer pipe cross-section dimensions, sewer pipe materials and sewer pipe slopes for the large diameter sewers in the Union Street Pump Station tributary area are included in Tables 4-1 through 4-7.

A copy of the large diameter sewer schematic and Tables 4-1 through 4-7 are included in Attachment 4.

QUESTION 5. Describe the hydraulics of the storm drain system, as it existed on October 9, 2013, from CSO regulator 031 downstream to the outfall to New Haven Harbor. Provide the peak hydraulic grade line at mean high tide, for the 1-year, 2-year, 10-year, and 100-year storms of the following durations: 15 minutes, 60 minutes, 3 hours and 24 hours. This analysis should account for daily peak flows due to diurnal variations and seasonal peak flows during periods of increased infiltration. Include for reference the ground elevations, sewer manhole rim elevations, pipe invert elevations, pipe cross-section dimensions, pipe materials, pipe slope, the elevation of the overflow weir, and the elevation of the rim of the lowest catch basin inside the UARG.

Please refer to the City of New Haven's response to QUESTION 3 of the City's RFI for a discussion of peak HGLs in the storm drain system under the specified conditions.

QUESTION 6. Describe the storm with the minimum return period that would result, as it existed on October 9, 2013, in the presence of sewage outside of the collection system at the Under Air Rights Garage during mean high tide, daily peak sewer flows, and seasonal peak infiltration flows. Include the duration and depth of storm, and identify the precise points in the separate sanitary sewers and combined sewer collection system from which sewage would be released.

The UARG is served by a dedicated storm drain system that was constructed by the Connecticut DOT in 1957 and 1979. There are no sewer connections or sewer flows to this storm drain system. This drain is known as the "Route 34 Drain" in the Cardinal Engineering SWMM model.

A schematic of the drain system in this area is included in the Overview Attachment.

The results of the storm drain SWMM model, summarized in Table 2 of the City's RFI response, indicate that the storm drain system capacity is exceeded during the 25 year 15 minute, 10 year 60 minute, and 10 year 6 hour storm events. This causes street flooding in the area of the manhole at CSO Regulator 031.

CSO Regulator 031 is located on South Frontage Road 380 feet east of the intersection with York Street. All of the sewers tributary to this regulator have been separated. Regulator 031 was closed on October 10, 2013. The CSO was connected to the storm drain in South Frontage Road. This drain is known as the "West Water Street Drain" in the Cardinal Engineering SWMM model. The South Frontage Road Drain is independent of the Route 34 Drain and does not connect to the Route 34 Drain until it reaches the Union Avenue Junction Chamber (over one half mile downstream of the UARG and the TSG).

In summary, there are no storm events that would result, as it existed on October 9, 2013, in the presence of sewage outside of the collection system in the vicinity of the UARG.

QUESTION 7: Describe the storm with the minimum return period that, given current conditions, will result in the presence of sewage outside of the collection system at the Under Air Rights Garage during mean high tide, daily peak sewer flows, and seasonal peak infiltration flows. Include the duration and depth of storm, and identify the precise points in the separate sanitary sewers and combined sewer collection system from which sewage would be released.

The UARG is served by a dedicated storm drain system that was constructed by the Connecticut DOT in 1957 and 1979. There are no sewer connections or sewer flows to this storm drain system. This drain is known as the "Route 34 Drain" in the Cardinal Engineering SWMM model.

A schematic of the drain system in this area is included in the Overview Attachment.

The results of the storm drain SWMM model, summarized in Table 2 of the City's RFI response, indicate that the storm drain system capacity is exceeded during the 25 year 15 minute, 10 year 60 minute, and 10 year 6 hour storm events. This causes street flooding in the area of the manhole at CSO Regulator 031.

CSO Regulator 031 is located on South Frontage Road 380 feet east of the intersection with York Street. All of the sewers tributary to this regulator have been separated. Regulator 031 was closed on October 10, 2013. The CSO was connected to the storm drain in South Frontage Road. This drain is known as the "West Water Street Drain" in the Cardinal Engineering SWMM model. The South Frontage Road Drain is independent of the Route 34 Drain and does not connect to the Route 34 Drain until it reaches the Union Avenue Junction Chamber (over one half mile downstream of the UARG and the TSG).

In summary, there are no storm events given current conditions that would result in the presence of sewage outside of the collection system in the vicinity of the UARG.

QUESTION 8. Describe the hydraulics of the storm drain system from CSO Regulator 034 downstream to the outfall to New Haven Harbor. Provide the peak hydraulic grade line at mean high tide, for the 1-year, 2-year, 10-year, and 100-year storms of the following durations: 15 minutes, 60 minutes, 3 hours, and 24 hours. This analysis should account for daily peak flows due to diurnal variations and seasonal peak flows during periods of increased infiltration. Include for reference the ground elevations, sewer manhole rim elevations, pipe invert elevations, pipe cross-section dimensions, pipe materials, pipe slope, the elevation of the overflow weir, and the elevation of the lowest floor in the Temple Street Garage.

Please refer to the City of New Haven's response to QUESTION 6 of the City's RFI for a discussion of peak HGLs in the storm drain system under the specified conditions.

QUESTION 9. Describe the storm with the minimum return period that, given current conditions, will result in the presence of sewage outside of the collection system at the Temple Street Garage during mean high tide, daily peak sewer flows, and seasonal peak infiltration flows. Include the duration and depth of storm, and identify the precise points in the separate sanitary sewers and combined sewer collection system from which sewage would be released.

The TSG is served by a dedicated storm drain system that was constructed by the Connecticut DOT in 1957 and 1979. There are no sewer connections or sewer flows to this storm drain system. This drain is known as the Route 34 Drain in the Cardinal Engineering SWMM model.

A schematic of the drain system in this area is included in the Overview Attachment.

The results of the storm drain SWMM model, summarized in Table 2 of the City's RFI response, indicate that the storm drain system capacity is exceeded during the 25 year 15 minute, 1 year 60 minute, and 2 year 6 hour storm events. This causes street flooding in the area of the TSG downstream of CSO Regulator 034.

CSO Regulator 034 is located at the corner of George and Temple Streets. All of the sewers tributary to this regulator have been separated. The CSO is connected to the storm drain in Temple Street. This drain is known as the "Temple Street Drain" in the Cardinal Engineering SWMM model. The Temple Street Drain is independent of the Route 34 Drain and does not connect to the Route 34 Drain until it reaches the Union Avenue Junction Chamber (over one half of a mile downstream of the UARG and the TSG). Flow metering data from our CSO Flow Monitoring Program at Regulator 034 confirms that the storm drain system overflows into the sewer system during rain events.

Significant street flooding occurred at the intersection of Temple Street and North Frontage Road in the vicinity of the entrance to the TSG during the August 10, 2012 rain event (a 100 year 1 hour return period). A rain event of this magnitude is well beyond the design capacity of the storm drain system. City Parking Authority employees observed that the two sanitary sewer manholes located on either side of the garage entrance ramp were below the standing water until the street flooding subsided.

QUESTON 10. Describe the methodology used to perform the hydraulic analysis for QUESTIONS 4 through 9. Include information regarding storm hydrographs used.

The GNHWPCA worked closely with the City of New Haven and their consultants, Cardinal Engineering, to refine the SWMM model of the storm drain system. We met with them several times during the past three months to exchange information. We provided them with updated information of the sewer system configuration, specifically the details of how Regulators 031, 034 and 025 connect to the storm drain system. We also provided Cardinal Engineering with flow metering data from our CSO Flow Monitoring Program at Regulators 034 and 025 confirming that the storm drain system overflows into the sewer system during rain events (rather than CSOs occurring).

QUESTION 11. Provide information describing each active CSO regulator in the GNHWPCA collection system. For each CSO regulator, include:

a. the latitude and longitude of its location;

b. its current status as active or closed;

c. the CSO outfall to which it flows;

d. the time period for which flow metering has been performed;

e. the number of activations during calendar year 2013; and

f. the storm with the minimum return period for which a discharge occurred during calendar year 2013.

The latitude and longitude of each CSO regulator (item a) is included on page 25 of our current NPDES Permit # CT 01000366 issued by the Connecticut DEEP in 2011. Each regulators current status (item b) and the CSO outfall to which it flows (item c) are included in Table 11-1. The time period for which flow metering was performed (item d) is included in Meter Location Summary. The number of activations during calendar year 2013 (item e) and the storm with the minimum return period for which a discharge occurred during calendar year 2013 (item f) are included in Table 11-2. A copy of page 25 from our current NPDES Permit, the Meter Location Summary document, Table 11-1 and Table 11-2 are included in Attachment 11.

QUESTION 12. For each CSO outfall and CSO regulator closed since January 1, 1997, identify the date on which the structure was closed, and describe the measures taken to close the structure.

The information requested is included in Table 12-1. Each regulator overflow was closed by constructing a pipe plug in accordance with our Standard Construction Detail. A copy of Table 12-1 and our pipe plug construction detail are included in Attachment 12.

QUESTION 13. By January 31, 2015, provide a System Characterization consistent with Section 2 of EPA's September 1995 *Combined Sewer Overflows Guidance for Long Term Control Plan* (LTCP Guidance) (EPA 832-b-95-002).

The System Characterization was completed by CH2M HILL in 2001 as a part of our CSO LTCP. The Plan was approved by the Connecticut DEEP in 2003. The CSO LTCP was updated by CH2M Hill in 2008 and approved by Connecticut DEEP in 2011. We continue to implement the Plan in accordance with our Consent Order, agreed to by the GNHWPCA and Connecticut DEEP, in 2009. We have begun work on the next update of the LTCP which is due to be completed in 2016. A copy of the System Characterization is included in Attachment 13.

QUESTION 14. By July 31, 2015, provide a Development of Alternatives for CSO Control Update ("Alternatives Update") consistent with Section 3.3 of EPA's LTCP Guidance.

The Development of Alternatives was completed by CH2M Hill in 2001 as a part of our LTCP. The Plan was approved by the Connecticut DEEP in 2003. The CSO LTCP was updated by CH2M Hill in 2008 and approved by Connecticut DEEP in 2011. We continue to implement the Plan in accordance with our Consent Order, agreed to by the GNHWPCA and Connecticut DEEP, in 2009. We have begun work on the next update of the LTCP which is due to be completed in 2016. A copy of the Development of Alternatives is included in Attachment 14.

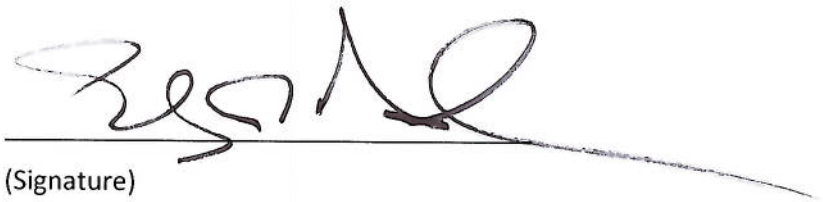
Greater New Haven Water Pollution Control Authority

Response to Questions 1 through 14, USEPA Information Request

Dated February 13, 2014

Statement of Certification

I declare under penalty of perjury that I am authorized to respond on behalf of the Greater New Haven Water Pollution Control Authority, of New Haven, Connecticut. I certify that the foregoing responses and information submitted were prepared under my direction or supervision and that I have personal knowledge of all matters set forth in the responses and the accompanying information. I certify that the responses are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.



(Signature)

Sidney J. Holbrook

(Printed Name)

Executive Director

(Title)

May 16, 2014

(Date)

Response of the Greater New Haven Water Pollution Control Authority to the
USEPA Request for Information dated February 13, 2014
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May 16, 2014

LIST OF ATTACHMENTS

Overview Attachment - A schematic of the drain system

Attachment 1 - A plan of the sewer system tributary to the Union Street Pump Station

Attachment 2 - A copy of the applicable pages of the Performance Evaluation Report and the LTCP

Attachment 3 - A copy of the Bypass Report filed with Connecticut DEEP, tidal data and rainfall data for each event

Attachment 4 - A copy of the large diameter sewer schematic and Tables 4-1 through 4-7

Attachment 11 - A copy of page 25 from our current NPDES Permit, the Meter Location Summary document, Table 11-1 and Table 11-2

Attachment 12- A copy of Table 12-1 and our pipe plug construction detail

Attachment 13 - A copy of the System Characterization

Attachment 14 - A copy of the Development of Alternatives